IN THE CLAIMS:

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of the Claims:

1-2. (Cancelled)

3. (Currently amended) A compound analysis system, the system comprising a micro-electrode array provided by a bio-compatible substrate having a plurality of electrodes situated thereon, said electrodes having an arrangement on said substrate corresponding substantially to that of an electrically active cellular network disposable in use thereon, a multi-channel amplifier coupled to said electrodes and an analyser operatively connected to said amplifier to determine for each active channel a vector quantity having a number of dimensions equal to a number of features derived from the electrical output of said electrically active cellular network with each component of said vector being representative of a change in said feature, wherein said analyser is adapted to determine a vector quantity having components representative of both local and global features across said channels.

4. (Previously presented) A compound analysis apparatus, the apparatus including a processor and a memory, the processor being operable in response to signals derived from a micro-electrode array connected, in use, thereto, to determine for each channel a vector quantity having a number of dimensions equal to a number of features derived from the multi-channel electrical output of said micro-electrode array with each component of said vector being representative of a change in said feature, wherein said memory contains a library of features characterising known compounds such that classification of said vector enables identification of a compound deposited, in use, on said array, in accordance with a predetermined measure of statistical reliability.

5. (Original) An apparatus as claimed in Claim 4, including a storage device, such that signals derived from said array are held by said storage device.

6. (Previously presented) A sensor for compound detection, the sensor comprising a receptacle for a micro-electrode array, said receptacle having a connector for receiving multi-channel electrical signals from said array when received in said receptacle, an amplifier for amplifying said signals and a processor, the processor being operable in response to said signals to determine for each channel a vector quantity having a number of dimensions equal to a number of features derived from the electrical output of said micro-electrode array with each component of said vector being representative of a change in said feature.

7. (Original) A sensor as claimed in Claim 6, further including a memory, said memory containing a library of features characterising known compounds such that classification of said vector enables identification of the compound deposited, in use, on said array,

8. (Previously Presented) A sensor as claimed in Claim 6 wherein the memory is integral therewith.

9-19. (Cancelled)

20. (New) A compound analysis system according to Claim 3, wherein said analyser is adapted to determine said vector quantity by analysing electrical activity in each active channel by imposing temporal and spatial information onto a model of the electrode array.

21. (New) A compound analysis system according to Claim 3, wherein said analyser is adapted to determine a vector quantity having a component representative of the propagation speed of action potentials.

22. (New) A compound analysis system according to Claim 3, wherein vector quantities determined for each active channel include redundant features.

23. (New) A compound analysis system according to Claim 3, wherein each said vector quantity is subject to cluster analysis to effect classification.